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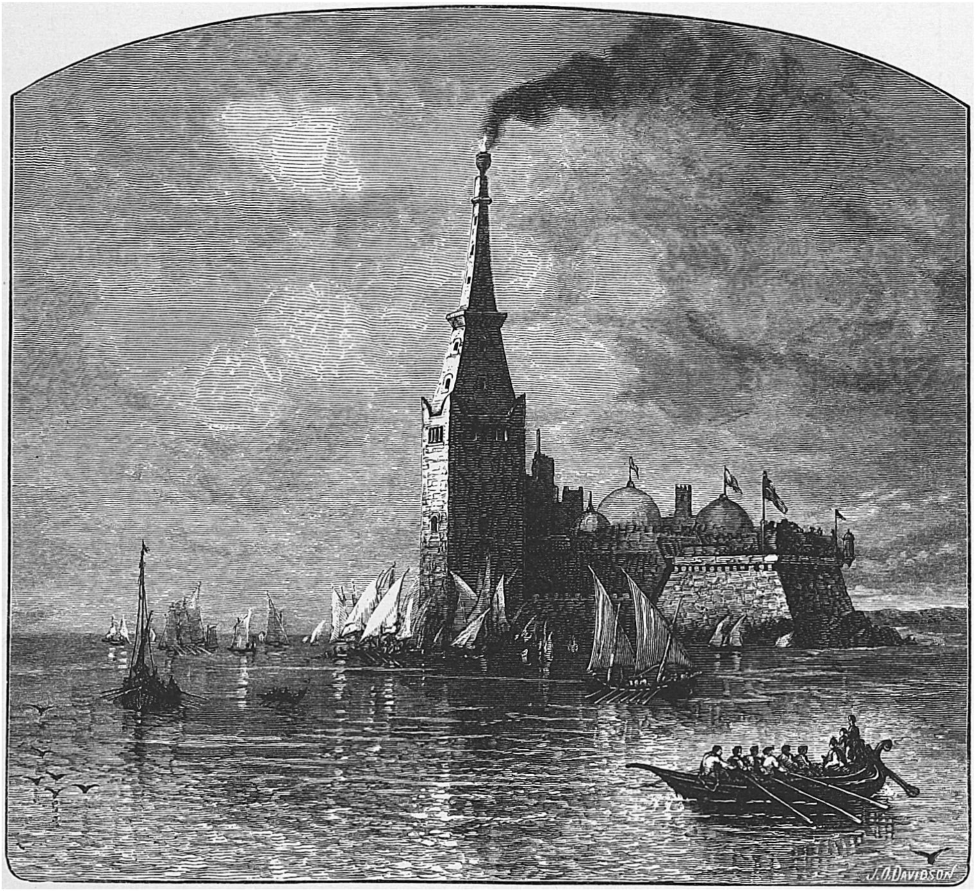
THE LIGHT-HOUSES OF OLD.

THE life of man is a battle to maintain the bare fact of existence. There is scarce anything that calls for the action of his energies which does not grow out of this endless and desperate struggle with a remorseless destiny that aims at his vitals as soon as he comes into the world. If he stays on land, the contest is sufficiently severe; but if, lured by ignorance, he ventures his fortunes on the seas, he then has still more cause to wonder why he was created, and what was at one time comparatively a safeguard becomes at once a peril. Resenting the whim which leads a man to go to sea, no sooner does he leave the land than it becomes an enemy to him, and on every hand threatens his ship and his life with reefs, shoals, and implacable cliffs.

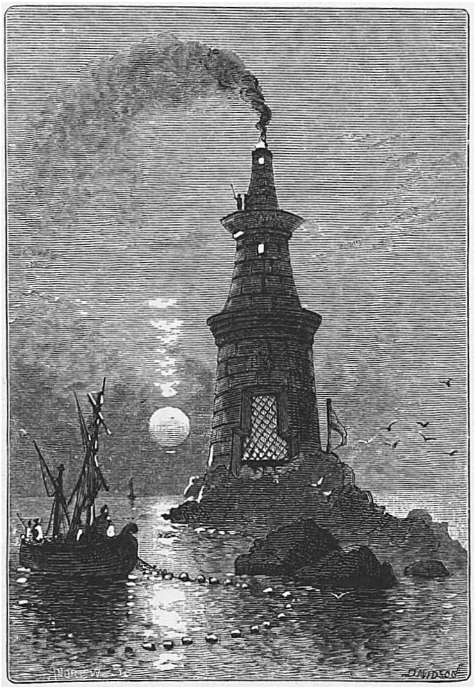
With Nature thus fighting for his life both by land and sea, this plaything of the storms, this puppet of Fate, is forced to invent various means and devise every precaution to avoid losing the questionable gift of life. And one of these is a system of warning-signals to avert him from the dangers awaiting him as he approaches a coast. Beacons by day, light-houses by night, are some of the means thus employed. But so admirable are the light-houses which during the last century have been erected by civilised nations, so complete is the organisation that regulates them, that we are liable to conclude that light-houses or beacon-flames as a guidance to the mariner are a recent invention.



Pharos of Alexandria.

But although, when we pursue our inquiries on the subject beyond the fourteenth century, we are met with only brief data, and must sometimes resort to conjecture, yet enough has been recorded in the chronicles of the past to enable us to know that at least three thousand years ago the wits of man were called into play to devise means of approaching a dangerous coast in safety. The first attempt of the sort was simply a bonfire on the brow of a cliff. Then followed rude towers lit with burning torches. Something resembling this is indicated in the light with which it is said Hero sought to beacon Leander to her arms; while at the northern mouth of the Thracian Bosphorus, overlooking the stormy Euxine, we find undoubtedly one of the first spots where the mariner of prehistoric times sought to guide his uncertain path over the treacherous seas. The legends which surrounded that locality, and already invested it in the time of Jason with vague terrors that undoubtedly had a basis in fact, indicate that this would naturally have been the scene for beacon-fires and torch-lit towers, as it is at the present day. On the low promontories which jut beyond the high, precipitous shores, light-houses were undoubtedly placed at a very early day. What is even more than conjecture is the almost certainty that on the lofty hill on the eastern side of the Bosphorus, near the entrance, a warning flame was placed at a very remote period, for we know that many hundred years before Christ a temple stood there dedicated to Jupiter Urins, as the god of mariners and storms, and that sailors ascended there to consult the omens before venturing to brave the lowering Euxine. Remains of that temple are found there to this day, and Turkish sailors still climb to that height in dubious weather to consult the signs of the heavens before trusting their picturesquely clumsy coasters to the wrath of the genius of the Black Sea.

It is curious that no record is made of light-houses in Greece at a time when the genius of Pericles was fortifying Athens in such a magnificent manner, and furnishing her three ports with the finest harbour defences and dockyards of antiquity. And yet there is every reason to believe that the narrow entrance to the Piræus was indicated by beacon-lights at least.



Roman Pharos.

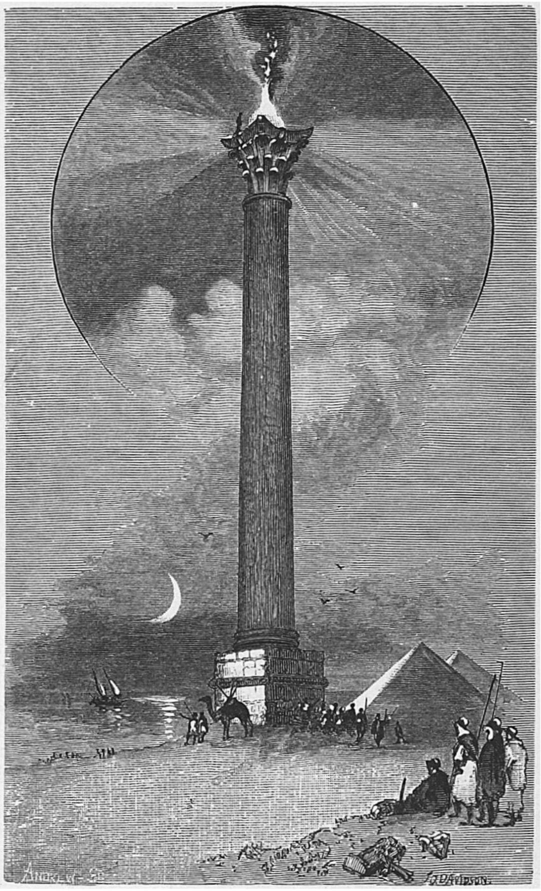
From a Medal found at Apameia, time of Augustus.

Over one hundred years later was erected the famous Colossus at Rhodes. Designed by the sculptor Chares, it was of bronze, one hundred and five Grecian feet in height, or about one hundred and twenty English feet, and stood commandingly over the narrow entrance of the port. It is stated that the colossus was constructed in honour of Apollo, and there is some obscurity as to its having been made exclusively for a light-house, but its position, and the very fact that Apollo was the god of light, give colour to the well-defined tradition that this statue also held a torch in its enormous uplifted right hand to guide the mariner at night, the light being reached by a stairway in the enormous arm. The colossus reminds us of the hypothesis that the Cyclops of Sicily was really a beacon-tower, whose single eye in the middle of his forehead was in reality a torch.

But the most famous of all light-houses, and at the same time the first one of which we have a tolerably complete description, and a specific statement that it was built expressly for such a purpose, was the Pharos of Alexandria, in Egypt. It was built by Ptolemy Philadelphus, about 270 B.C., on a small island at the entrance to the harbour, and connected by a causeway with the mainland. The Pharos cost eight hundred talents: if these were silver talents, as most likely they were, that would be equal to $850,000, probably the largest sum ever expended on a light-house. The base of this structure was said to have been some four hundred feet square. This probably referred to a wall of circumvallation, although it is not impossible that the typical form of Egyptian architecture, the pyramid, may have been partly adopted in the construction of the Pharos. But, although pyramidal in general form, this outline was broken by different stories, decorated with galleries and columns, and, as the whole was built of white marble, the effect must have been at once elegant and impressive. The height was about four hundred and fifty feet above the sea-level; and at the summit fires were kept burning to direct the mariner through the tortuous entrance into the bay.

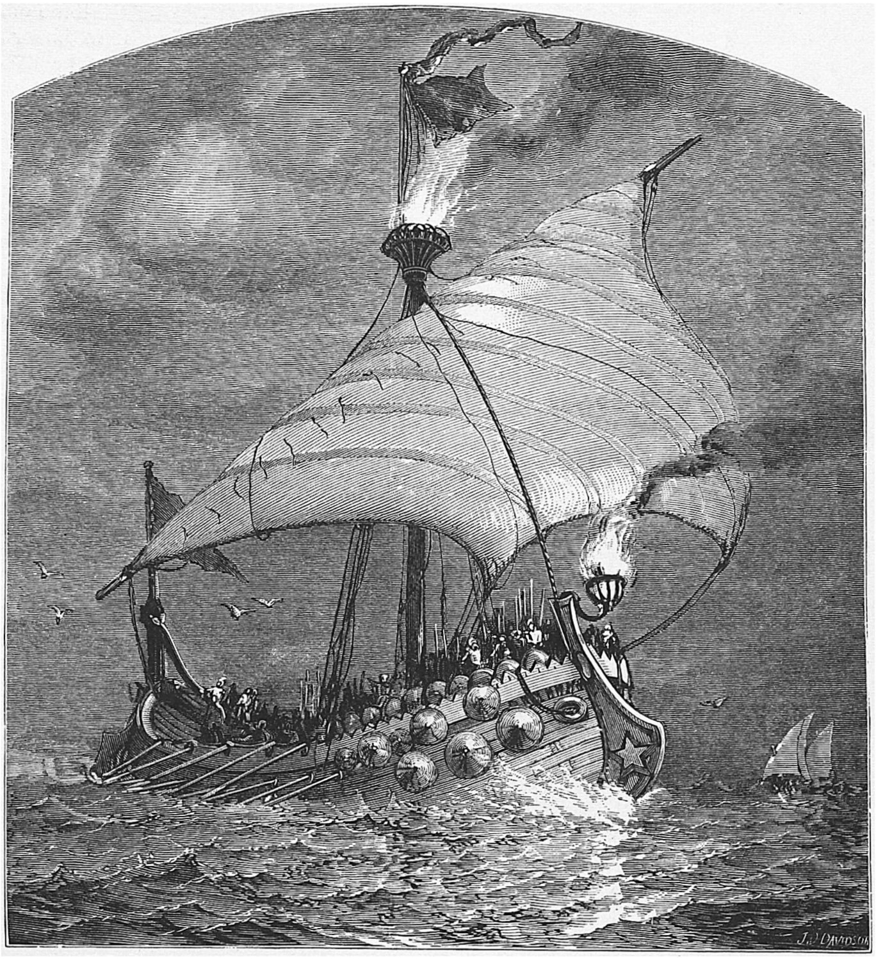
It was said by some of the ancients that the flame of the Pharos could be discerned one hundred miles at sea, which is a most preposterous estimate, especially as they had no night-glasses in those times to assist the vision. A first-class light of modern times, with all the latest inventions for increasing its intensity, is only visible thirty miles at sea, without regard to the height of its elevation. It is altogether unlikely that the smoky gleams of the ancient Pharos were seen over twenty to twenty-five miles on a clear night.

One of the most remarkable circumstances connected with the Pharos was regarding its architect Sostratus. It seems he was anxious to perpetuate a sort of copyright to his authorship in the work, and according to Strabo he caused the following inscription to be cut into the marble: "Sostratus the Cnidian, son of Dexiphanes, to the gods the preservers, for the advantage of mariners." That Ptolemy should have been willing to have an inscription placed on the Pharos which awarded to another the whole glory of the undertaking, seems an excess of magnanimity impossible to expect in an Oriental monarch, although he might have permitted the addition of a legend simply stating the name of the architect. It is therefore not surprising to find that another ancient writer states explicitly that, after cutting the above inscription in the stone, Sostratus caused it to be filled in with a hard cement, on which he engraved another inscription, awarding the credit of the work to the king its founder. In the course of ages, the cement wearing away, the original inscription was revealed. Some commentators have considered the last statement absurd. To us, aside from the unnecessary invention of a tale that would be altogether gratuitous, this seems far more likely, from the nature of the case, to be the true version of the fact.



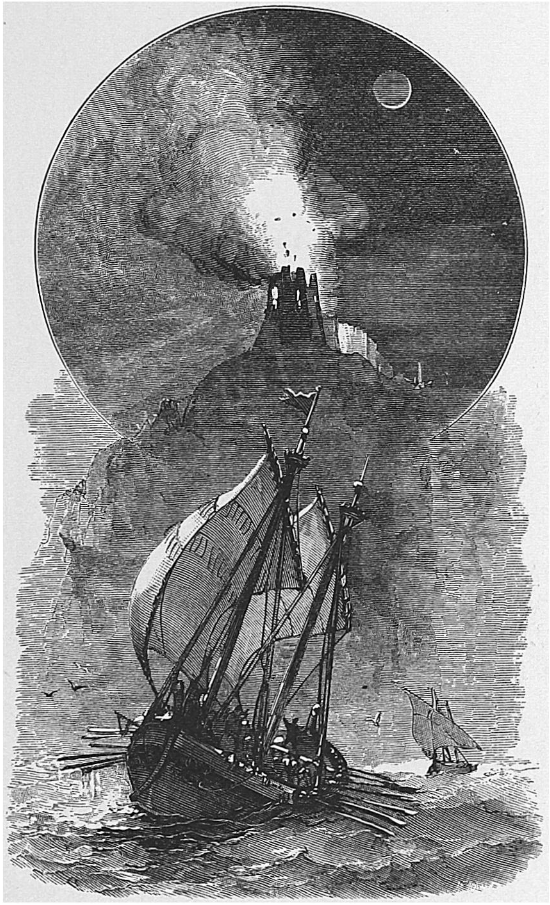
Pompey's Pillar.

But whatever be the truth regarding Sostratus, the work of his genius continued for ages to shed its beneficent rays over the tossing waters of the Mediterranean, "nocturnis ignibus cursum navium regens," as Pliny records. It is not generally known that the Pharos stood until 1303, or something over sixteen hundred years. But to what cause it finally owed its destruction does not seem to be distinctly stated. It is certainly a fact so remarkable as to be something more than a coincidence that so many of the masterpieces of ancient architecture should have survived the wreck of so many centuries until the revival of the arts in Europe was preparing the world once more to appreciate their merits, and then, by one untoward event or another, were either completely destroyed, or, like the Parthenon, sadly mutilated. The imagination of the Saracens, ever lively and fond of attributing something supernatural to whatever was uncommon, gave rise in the Dark Ages to the legend that Alexander the Great was the builder of the Pharos, placing at the summit a mirror endowed with talismanic virtues. Such was its mystic power that it was said approaching ships, while still at a long distance, could see themselves reflected in this mirror. What was a yet more remarkable property of this magic reflector, and one that gave the Pharos a singular celebrity in those ages, was the circumstance that on the duration of this mirror was supposed to hang the existence of Alexandria. In our more practical age we can see that a certain degree of truth was involved in the legend. The continued existence of the Pharos implied the commercial prosperity of Alexandria; while its destruction would seem to suggest a decline in the maritime trade of one of the great emporiums of antiquity. This interlinking of the fate of city and beacon-fire was emphasised by the fact that the Pharos, situated as it was on the west side of the very narrow entrance to the port, served the double purpose of light-house and fortress, thus protecting the two dearest interests of the neighbouring city.



Roman Light-ship and Coast-guard.

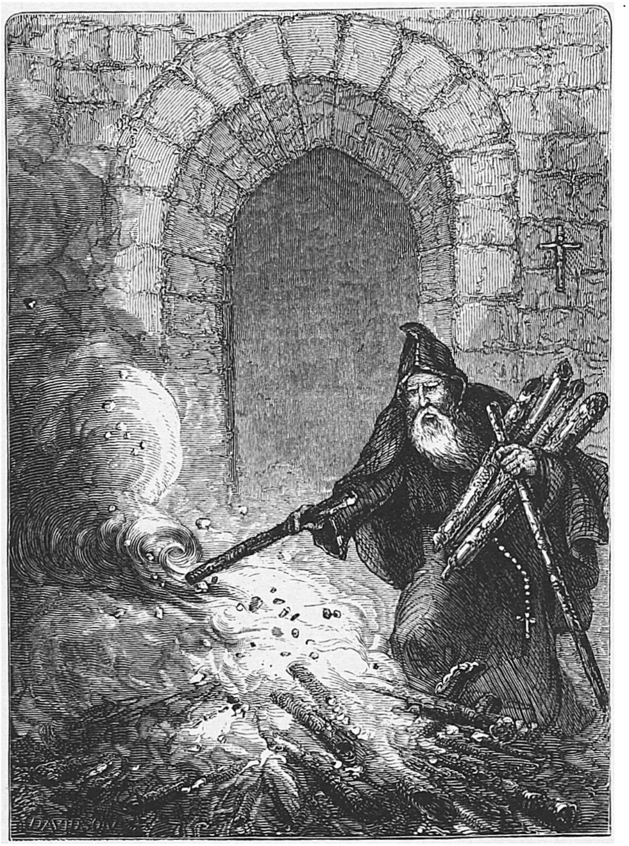
The building of the Pharos of Alexandria became the signal for the construction of many light-houses of somewhat elaborate character. That Carthage, the greatest purely maritime power of the ancient world, protected her mariners by light-houses is altogether likely, especially as the dockyards and mole of her port were of the most extensive and complete character, although a matter of conjecture. But that the Romans, after the fame of the Pharos of Alexandria became noised abroad, gave considerable attention to lighting the entrance to their harbours at least, is a fact of precise record, the generic name given by them to light-houses being borrowed from that of the original Pharos, as it has also been perpetuated by the Latin nations of modern times. Light-houses are mentioned at Caprea, Ostia, and Puteoli. One at Ravenna is stated to have equalled that of Alexandria in splendour. Nor did the Romans confine these hospitable structures only to the coasts of Italy, but with the wide, far-reaching, and beneficent policy which they followed in all their conquests as soon as a country was fairly quiescent under their sway, the line of their costly light-houses extended from the Atlantic to the Euxine, from Britain to Pontus. Especially noteworthy among these light-houses of this mighty empire were those at the mouth of the Guadalquivir, near Gades; at the mouth of the Chrysorhoäs, on the coast of Syria; at Rhodes; on the Bosphorus; and at Cyzicus, in the Sea of Marmora. A fair indication this of the former commercial importance of Cyzicus, of which now but the merest fishing-village remains.



Roman Pharos at Dover.

Pompey's Pillar, at Alexandria, singularly so called, for it was erected by Diocletian, is reputed to have served as a beacon. On the coast of Britain numerous light-houses, either simple or elaborate, were also erected by the Romans, of which in a few instances remains still exist. There was one, for example, at Dover, and another on the opposite coast of France at Boulogne, and the widely-spread diffusion of what seems to have been an organised system of light-houses under government control is also evidenced by the designs of such structures still preserved on old Roman coins.

At Gaireg, in Wales, we find still another relic of the Roman Empire and the general beneficence of its rule. An old Roman



Hermit tending Beacon-light.

light-house actually stands there to this day, intended originally to guide the mariner along the tortuous channel from Deva, or Chester, to Seteia Portus. It is circular, quite lofty, and the interior diameter is twelve and a half feet, while the extreme diameter is twenty-one feet. In the upper story, on the side exposed to the sea, are eight small square holes faced with freestone. Each of these apertures was formerly separated from the others by strong partitions of wood, and a torch or fire was burned nightly in each compartment. The light was thus divided in order to prevent the light as a whole from appearing at a distance like a star. The light-house at Dover seems to have been constructed very much after the same plan. Another Roman, or more likely Celtic, light-house seems to have stood on the height in the north of Wales now called Holyhead, but in former days named Peny Gaer Gybi, or Hill of Flames.

About a league from Corunna, in Spain, one may still see the remains of another Roman light-house from a lofty height guiding the mariner tossed on the stormy waves of Biscay's turbulent waters. The form and position of this venerable structure, perhaps also other reasons of which the memory is forgotten, seem to have produced a strong impression upon the popular mind in bygone ages, for legends have been attached to it, and it is actually the subject of a chapter in that wild, grotesque, old-time romance called the "Troy Boke," forming the second section of that story. In that veracious chronicle it is recorded that Hercules built that light-house over the tomb of the giant Gerian whom he had slain, and, building it in honor of the heroine Corogne, at the summit of the structure he fixed a statue of bronze, and in its hands placed a mirror which was indeed a safeguard to the city and adjacent territory, because, whenever a hostile fleet was approaching the coast, it was reflected in that wonderful mirror, and thus, its attack being anticipated, was baffled.

The generous, far-sighted conduct of Rome in all that related to its commercial relations was again discernible in its system of lighted coast-guard galleys watching the sea with a cresset or flame at the mast-head. These vessels were of especial use at the time when corsairs swept the Mediterranean, destroying many ships, and obliging Pompey to exterminate them. It is not a little curious that his sons in turn should have become corsairs, and afflicted Rome after the death of their father. Stationary light-ships do not seem to have been employed, however, until the eighteenth century.

When we come to a consideration of the times when Christianity became a dominating influence in the progress of civilisation, we find that the convents and orders of monks which were so generally beneficent in those ages, being suited to the peculiar needs of a society that was passing from one condition to another, also assisted in devising means for the protection of the tempest-tossed mariner, and, when no light-houses existed, exhibited from the headlands on which their convents were situated, whether by the ocean-side or overlooking the devious Rhine, fires of wood or torches dipped in tar, for the benefit of galleys or rafts. Thus at Sagres, on Cape St. Vincent, one of the wildest capes of Europe, for evermore lashed by the thundering surges of the Atlantic, the beacon-flame of the friendly Fathers, composed of pine-fagots or torches suspended in an iron cage, warned the sailor to steer for the open sea.

And thus the ages came and went. Commerce, after the fall of the Roman Empire, once more increased; navigation became

Watch-tower on the Rhine.

more scientific and daring than ever before; the invention of the compass, and the construction of ships better adapted to buffet ocean-storms, brought with them also the growing necessity of devising means for increasing the safety of life and property, and methods of insuring ships were also introduced, a measure which had obtained vogue in the prosperous times of Greece and Rome, but had gradually died out, until Venice again brought it into practice. Thus, too, in the most natural manner, a more perfect system of lighting dangerous coasts became a question of vital importance to ship-owner and sailor, and the immediate results became evident in the construction of the magnificent Pharos of Genoa, erected on the mole of that port when that city of palaces and merchant princes and admirals vied with Venice for the empire of the seas. Its style was elegant early Renaissance, and it soared and still soars three hundred and eighty-five feet above the water.

About the same time, in the reign of Henry VII., England showed a disposition to coöperate in the benevolent enterprise of mitigating the perils of the seas by founding the corporation of the Elder Brethren of the Holy and Undivided Trinity, better known as the Trinity House, established for the purpose of piloting ships and lighting the coasts, and designed to have control of the shores and adjacent waters of England and Wales, a pious work which it maintains to this day, Scotland and Ireland having distinct light-house boards of their own. The Trinity House corporation consists of a master, a deputy-master, nineteen acting elder brethren, eleven honorary elder brethren, and an unlimited number of younger brethren. Their supervision does not, however, necessarily include the supervision of small, purely local light-houses or beacons, which are left to the care of the municipal authorities.

A century later we are not surprised to find that the subject of lighting coasts had reached such importance that the French crown, among numerous other important light-houses, constructed the Tower of Cordouan, which in hydraulic architecture holds a rank never surpassed in modern times. Other light-houses have, perhaps, been built since then, combining superior constructive qualities, but none that equal it in architectural costliness and elegance. It is fitting that a superb city like Bordeaux should have the approach to its magnificent quays guarded by a sentinel like that of Cordouan.

Two leagues from the mouth of the Garonne lies a rock or reef some seven hundred feet long and nearly as broad at low water, but almost entirely covered at high tide. It is of the most dangerous character, and, after many an ill-fated bark had been lost on its cruel ledges, it was finally decided in the teeth of the elements to construct a light-house upon it. The task was undertaken during the reign of Henry II., in the year 1584, and was entrusted to Louis de Foix, the famous architect, who did not see it completed until 1610, in the reign of Henry IV. In consonance with the taste of the time, the builder adopted an ornate Renaissance style for the plan of the light-house, and the result was a structure of great durability, elegance, and beauty, in which no expense was spared; which led, however, to the observation that only an architect could have been so absurd as to lavish such moneys upon decorations that could be of no practical value when applied to a building so remote from public appreciation.

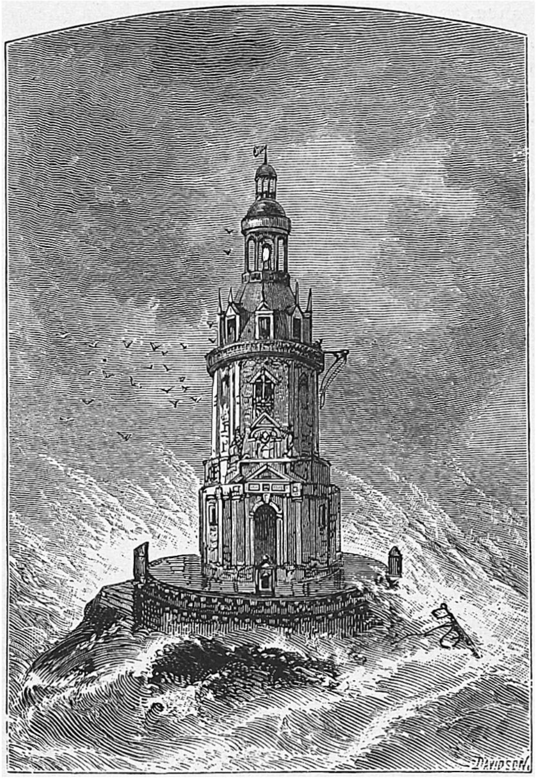
The tower is surrounded and protected from the surges of the ocean by a lofty, circular, and slightly-sloping wall of circumvallation, one hundred and thirty feet in diameter. The entrance, which is on the southeast side, is through a passage let into the very massive masonry of this fortress-like wall; and within it, like bomb-proof casemates, are also included the apartments of the four keepers.

From the centre of the enclosure soars the tower to a height of one hundred and eighty-six and one-half feet. The original elevation was one hundred and sixty-nine feet, which was increased in 1727 to the present height. The external appearance of the light-house is altogether contrary to the notion we generally have of such a structure, being somewhat pyramidal, the breadth of the base gradually tapering towards the summit, and with its cornices, pillars, statuary, and domed lantern, reminding one of a monument like the Hôtel des Invalides at Paris.

The first story contains a noble vaulted hall and two adjoining apartments, under which are the cellar, provisioned for six months, and the cistern provided with rain-water falling from the roof. Above the ground-floor, or *rez du chaussée*, is a floor called the Apartment of the King, containing an elegant vestibule, a large reception-hall, and side-offices. The third story includes a very ornate circular, vaulted, and gilded chapel, whose ceiling is chequered with marble panels. When the weather permitted, it was the custom in former times for a priest to cross over from the mainland and offer mass for sailors in this unique sanctuary. Among its other decorations are busts of Louis XIV. and XV., and also of the architect of the light-house.

In the façade of the first story is a highly-ornamented doorway, over which are carved the arms of France supported by statues of Mars and of a female, possibly a nereid, holding a diadem and a branch of palm. In side-niches below are statues of Henry II. and Henry IV. A separate circular tower attached to the main structure encloses a stairway with a landing at each story, and thus the harmony of the various apartments is undisturbed by stairs or ladders.

The Tower of Cordouan was first lighted by a coal-fire in an iron cage. As the heat gradually calcined and crumbled the walls, the lantern was levelled away in 1717, and the light was exhibited one story lower. But as this change, by reducing the distance of the radiation, caused much complaint, an iron lantern was again constructed, carried this time several feet above the first height of the tower, and the basin containing the candles substituted for a coal-fire was supported on a massive iron pillar. Various changes in the method of lighting the Tower of Cordouan have been substituted from time to time since then. It is the first light-house that was ever furnished with a revolving light, and is now made effective in the wildest storms by a dioptric light of the first order.



Tower of Cordouan.

Next to the Tower of Cordouan, there is no light-house of modern civilisation which takes precedence of the Eddystone in point of historic interest and importance. But it is, of course, not to be compared to that of Cordouan from an architectural point of view. The narrow foundation afforded by the rock on which it stands, the extreme difficulty of building there, and the thoroughly practical, not to say prosaic, spirit which has characterised Anglo-Saxon methods on this subject at least, cause the Eddystone Light-house to be interesting solely as a triumph of scientific engineering.

S. G. W. BENJAMIN.